



from experience

Sweeping Dust Under the Hood: Local Exhaust Ventilation

To effectively collect dust and vapors within a food plant, the capture (or face) velocity at the collection hood is very important. Controlling these emissions is accomplished by first minimizing air motion caused by the process, then “capturing” the dust- or vapor-laden air in a Local Exhaust Ventilation (LEV) hood. Flow toward the opening of the hood must be sufficiently high to maintain the necessary capture velocity and overcome any opposing air currents within the process. Hixson uses the table below to assist in the design and/or selection of LEV hoods:

RANGE OF CAPTURE VELOCITIES*		
Environmental Condition of the Dust or Vapor	Food Plant Examples	Typical Capture Velocity (Ft/Min)
Released with practically no velocity into quiet air.	Evaporation from tanks, powder degassing or de-aeration.	50 - 100
Released at low velocity into moderately still air.	Powdered coating spray or sprinkle systems; bag dumping; container filling; low-speed conveyor transfers.	100 - 200
Active generation into a zone of rapid air motion.	Rapid bag dumping; barrel filling; conveyor loading; sifters.	200 - 500
Released at high initial velocity into a zone of very rapid air motion.	Dry ingredient blending or tumbling; sugar or salt de-lumping or sifting; block ingredient grinding.	500 - 2000

In each category above, a range of capture velocity is shown. The proper choice of values depends upon several design parameters as shown below:

CAPTURE VELOCITY		
Design Parameter	Use Low End When...	Use High End When...
Room Air Currents Controlled	Air currents minimal	Disturbing
Toxicity/Hazard	Low, nuisance	High
Production Frequency	Intermittent	Heavy use, High
LEV Hood size	Large	Small, local

Once captured, the dust must be transported through suitably designed ductwork to a dust or fume collector. Minimum duct velocities are recommended by the American Conference of Governmental Industrial Hygienists so that the dust does not settle in the ductwork. As shown in “Experience in Brief,” many food and flavor dusts require velocities of 2,500 – 4,500 feet per minute (fpm) to stay suspended in the air stream.

*Reference: The American Conference of Governmental Industrial Hygienists. Industrial Ventilation: A Manual of Recommended Practice for Design, 23rd edition. Ann Arbor: Edwards Brothers, 1998.

experience in brief

Range of Minimum Duct Design Velocities*	
Nature of Containment	Design Velocity (fpm)
Very fine light dust	2500-3000
Dry dusts & powders	3000-4000
Average industrial dust	3500-4000
Heavy or moist dusts	4500 and up

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“New Products Conference”
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